

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

**(19) World Intellectual Property Organization  
International Bureau**



A standard linear barcode is positioned horizontally across the page, consisting of vertical black lines of varying widths on a white background.

(43) International Publication Date  
6 May 2005 (06.05.2005)

PCT

(10) International Publication Number  
**WO 2005/040593 A1**

- |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (51) International Patent Classification <sup>7</sup> :                                                                                                                            | <b>F02M 35/022,</b>                                                                                                                                                                                                                                                                                              | (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW. |
| (21) International Application Number:                                                                                                                                             | PCT/US2004/031124                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| (22) International Filing Date:                                                                                                                                                    | 23 September 2004 (23.09.2004)                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| (25) Filing Language:                                                                                                                                                              | English                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| (26) Publication Language:                                                                                                                                                         | English                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| (30) Priority Data:                                                                                                                                                                | 60/512,109 17 October 2003 (17.10.2003) US                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| (71) Applicant (for all designated States except US):                                                                                                                              | DONALDSON COMPANY, INC. [US/US]; 1400 West 94th Street, P.O. Box 1299, Minneapolis, MN 55440-1299 (US).                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| (72) Inventors; and                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| (75) Inventors/Applicants (for US only):                                                                                                                                           | XU, Jian [CN/US]; 6218 Orchid Lane North, Maple Grove, MN 55311 (US). GIESEKE, Steven, Scott [US/US]; 6239 Third Avenue South, Richfield, MN 55423 (US). BARRIS, Marty, A. [US/US]; 19526 Iredell Court, Lakeville, MN 55044 (US).                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| (74) Agent:                                                                                                                                                                        | BRUESS, Steven, C.; Merchant & Gould P.C., P.O. Box 2903, Minneapolis, MN 55402-0903 (US).                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| (84) Designated States (unless otherwise indicated, for every kind of regional protection available):                                                                              | ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG). |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Published:                                                                                                                                                                         | — with international search report                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.</i> |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

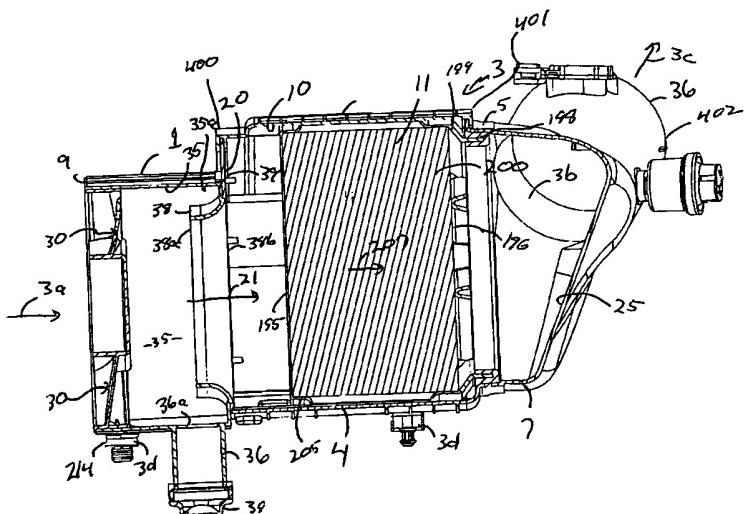
(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: PRECLEANER ARRANGEMENT FOR USE IN AIR FILTRATION, METHOD OF OPERATION OF PRECLEANER AND AIR CLEANER COMPRISING THE PRECLEANER ARRANGEMENT



(57) **Abstract:** A precleaner (1) arrangement for use in separating a portion of entrained material in air from air entering an air cleaner, is provided. The precleaner arrangement includes a vane structure positioned to direct air into a circular or cyclonic pattern, to facilitate material separation. The vane structure (30) includes one or more adjustable air deflection vanes. Each adjustable air deflection vane is constructed: to have a first position under no air flow or low air flow rate conditions; and, to deflect to import a more open, lower restriction, orientation under increased air flow rates. Preferred precleaner arrangement constructions, assemblies utilizing the precleaner arrangement and methods are described.